

B.E. Computer Science and Engineering
Fourth Year Second Semester, 2025

Subject: Industrial Management**Time: 3 hours****Full Marks: 100**

(The figures in the margin indicate full marks.)

Candidates are required to give their answers in their own words as far as possible)

GROUP: A (Answer all the questions)**(1 x 10 = 10)**

1. I. What is a critical path?

- (a) It is a path that operates from the starting node to the end node.
- (b) It is a mixture of all the paths
- (c) It is the longest path
- (d) It is the shortest path

II. Which of the following is not a factor affecting the location decision?

- (a) Availability of raw materials
- (b) Availability of labor
- (c) Transportation costs
- (d) Employee morale

III. Which of the accompanying addresses how much time it takes for a capital budgeting undertaking to recuperate its underlying expense?

- (a) Maturity period
- (b) Payback period
- (c) Redemption period
- (d) Investment period

IV. The function involves the decision when, what, how, and why to produce goods.

- (a) production planning
- (b) production control
- (c) method analysis
- (d) quality control

V. Ship Building and Aircraft manufacturing is an example of _____ type of layout.

- (a) combined
- (b) matrix
- (c) fixed
- (d) group

VI. If the fixed and variable cost at 70% production capacity are Rs.20,000 and Rs.42,000, respectively, the total cost at 50% capacity will be-----?

- (a) 50,000
- (b) 62,000
- (c) 30,000
- (d) 21,000

VII. Which one of the following is a direct cost of a chair manufacturer?

- (a) Cost of setting up the factory web-site
- (b) Timber
- (c) Factory phone bill
- (d) Bulb for the Factory

VIII. What is a business doing at Break Even Point?

- (a) Making a loss
- (b) Producing a start-up output
- (c) Making neither a profit nor a loss
- (d) Making a profit

IX. In PERT, if $T_o=3$, $T_m=12$, $T_e=12$, then $T_p=?$

- (a) 21
- (b) 10.5
- (c) 3
- (d) 12

X. A Ltd., a large scale industry manufactures Product K of 24 units per shift of 8 hours. The standard time per unit is 15 minutes. What is the productivity of the per shift of 8 hours?

- (a) 50% (b) 60% (c) 75% (d) 80%

GROUP: B (Answer any five questions)

(6 x 5 = 30)

2. Draw a network diagram.

Activity	Description	Immediate Predecessors	Expected Activity Time
A	Select office site	-	3
B	Create Organizational and financial plan	-	5
C	Determine personnel requirements	B	3
D	Design facility	A,C	4
E	Construct interior	D	8
F	Select personnel to move	C	2
G	Hire new employees	F	4
H	Move records, Key personnel, etc.	F	2
I	Make financial arrangements with Institutions	B	5
J	Train new personnel	H,E,G	3

3. What is the present value of Rs 6000 at the end of three years by investing at 10% (Calculate by using the present value factor).

4. A Company producing a single product sells it at Rs. 100 each. The marginal cost of production is Rs.60 each and fixed cost is Rs.40000. Answer the following questions from this information:

- The amount of sales to earn a profit of Rs.50000
- The new break even sales if sales price is reduced by 10%

5. Define Productivity. What are the factors affecting productivity?

6. An operator manufactures 50 jobs in 6 hours and 30 minutes. If this time includes the time for setting his machine, calculate the operator's efficiency. Standard time allowed for the job was: Setting Time = 35 mins. Production time per piece = 8 mins.

7. What are the various functions of Management?

8. A manufacturer produces three models I, II and III of a certain product. He uses two types of raw materials A & B of which 4000 and 6000 units are available, respectively. The raw material requirements per unit of the three models are given below:

Raw Materials	REQUIREMENT PER UNIT		
	I	II	III
A	2	3	5
B	4	2	7

The labour for each unit of model I is twice that of model II & three times that of model III. The entire labour force of the factory can produce the equivalent of 1500 units of model I. A market survey indicated that the minimum demand for the three models is 200, 200 & 150 units, respectively. However, the ratios of the numbers of units produced must be equal to 3:2:5. Assume that the profit per unit of model I, II & III is Rs 30, Rs 20 & Rs 50, respectively.

Formulate the problem as a Linear programming model to determine the number of units of each product that will maximize profit.

GROUP: C (Answer any four questions)

(15 x 4 = 60)

9. The initial outlay of a project is Rs 3,00,000. The firm expects the following annual cash inflows from the project over the years:

Year	1	2	3	4
Cash flow	75,000	1,20,000	1,20,000	1,50,000

Compute profitability index of the project if the cost of capital is 10%

10. Define HRM? Explain its elements and significance to organizational development.

11. Solve graphically the given linear programming problem. (Minimization Problem).

$$\text{Minimize } Z = 3a + 5b \text{ S.T}$$

$$-3a + 4b \leq 12$$

$$2a - 1b \geq -2$$

$$2a + 3b \geq 12$$

$$1a + 0b \geq 4$$

$$0a + 1b \geq 2$$

$$\text{and both } a \text{ \& } b \text{ are } \geq 0.$$

12. The initial outlay of a project is Rs 25,00,000. The firm expects the following annual cash flows which from the project over the years:

Year	1	2	3	4	5	6	7
Cash flow (Rs.in Lacs)	7	6	6	5	4	4	8

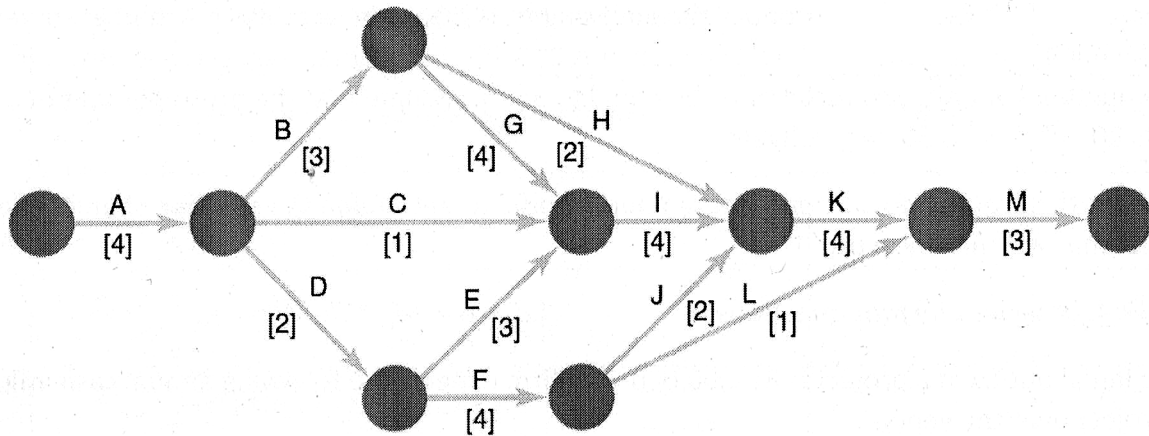
Calculate the Internal Rate of Return on the project. (Use 10% & 14 % discount rate for the computation)

13. What are the classical types of plant layout? What are their advantages and disadvantages?

14. As a project manager, you are faced with the activity network and estimated activity times (in days) shown in the below figure. For each activity, find out the

- i. Earliest start time
- ii. Earliest finish time
- iii. Latest start time
- iv. Latest finish time
- v. Slack

In addition, identify the critical path and calculate the project duration.



Annexure: Present Value Table

Year	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870
2	.890	.873	.857	.842	.826	.812	.797	.783	.769	.756
3	.840	.816	.794	.772	.751	.731	.712	.693	.675	.658
4	.792	.763	.735	.708	.683	.659	.636	.613	.592	.572
5	.747	.713	.681	.650	.621	.593	.567	.543	.519	.497
6	.705	.666	.630	.596	.564	.535	.507	.480	.456	.432
7	.665	.623	.583	.547	.513	.482	.452	.425	.400	.376
8	.627	.582	.540	.502	.467	.434	.404	.376	.351	.327
9	.592	.544	.500	.460	.424	.391	.361	.333	.308	.284
10	.558	.508	.463	.422	.386	.352	.322	.295	.270	.247
11	.527	.475	.429	.388	.351	.317	.288	.261	.237	.215
12	.497	.444	.397	.356	.319	.286	.257	.213	.208	.187